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PATENT LAW GROUP LLP
2635 NORTH FIRST STREET
SUITE 223
SAN JOSE, CA 95134

EXAMINER	
ALAM, SHAHID AL	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/655,951
Filing Date: September 04, 2003
Appellant(s): CAMERON ET AL.

David C. Hsia
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 2, 2008 appealing from the Office action mailed September 28, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Hitz, Dave et al., "File System Design for an NFS File Server Appliance", Technical Report 3002, Rev. C 3/95, Network Appliance, January 19, 1994.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Dave Hitz et al. (File System Design for an NFS File Server Appliance).

With respect to claim 1, Hitz teaches a computer readable medium for a data storage device encoded with a snapshot tree structure and code for managing the snapshot tree structure to provide point-in-time back-ups of a base volume (Figure 2), the snapshot tree structure comprises:

a first branch (Figure 3C), comprising:

the base volume storing a current user data (page 5, Introduction, paragraph 5); a first read-only snapshot descending from the base volume (Figure 4 and corresponding text), the first read-only snapshot being created at a first time, the first read-only snapshot storing a first data of the base volume at the first time before the first

data is modified in the base volume (Figure 3b, paragraph 3.4; create new snapshot by making duplicate copy of the root inode); and

a second read-only snapshot descending from the first snapshot, the second read-only snapshot being created at a second time earlier than the first time, the second read-only snapshot storing a second data of the base volume at the second time before the second data is modified in the base volume (Figure 4 and corresponding text; contents are written to a new location); and

instructions to retrieve data from the snapshot tree structure and transmitting the retrieved data to a host device (Snapshots use a copy-on-write technique to avoid duplicating disk blocks that are the same in a Snapshot as in the active file system. System administrators can use Snapshots to create backups safely from a running system. The write-anywhere design enables the copy-on-write technique used by Snapshots. For Snapshots to work, WAFL must be able to write all new data, including meta-data, to new locations on disk, instead of overwriting the old data.

To move a file from one directory to another, the file system must update the contents and inodes of both the source and target directories. WAFL receives requests only from the NFS client code of other systems. NFS client code converts file system requests into a regular pattern of network requests, and it filters out error cases before they reach the server (pages 6, 9 and 19).

As to claim 2, a second branch, comprising a first read-write snapshot descending from one of the first and the second read-only snapshots (see Figure 4).

As to claim 3, the second branch further comprises a third read-only snapshot descending from the first read-write snapshot, the third read-only snapshot being created at a third time, the third read-only snapshot storing a third data of the first read-write snapshot at the third time before the third data is modified in the first read-write snapshot (see Figure 4; written to a new location up to the root of the tree).

As to claim 4, third branch, comprising a second read-write snapshot descending from the third read-only snapshot (see Figure 4).

As to claim 5, the third branch further comprises a fourth read-only snapshot descending from the second read-write snapshot, the fourth read-only snapshot being created at a fourth time, the fourth read-only snapshot storing a fourth data of the second read-write snapshot at the fourth time before the fourth data is modified in the read read-write snapshot (see Figure 4; written to a new location up to the root of the tree).

With respect to claim 6, in addition to the rejection of claim 1, Hitz further teaches inserting the second read-only snapshot between the base volume and the first read-only snapshot, wherein the first read-only snapshot now descends from the second read-only snapshot (see Figure 4 and corresponding text).

Subject matter of claims 7 – 10 are rejected in the analysis above in claims 1 – 5 and these claims are rejected on that basis.

With respect to claim 11, Hitz teaches a method for retrieving a point-in-time backup of a base volume (Figure 2) by reading a value of a data block from a snapshot tree structure having a base volume, a first snapshot descending from the base volume, and a second snapshot descending from the first snapshot (Figure 4 and corresponding text), the method comprising:

searching for the data block in the second snapshot;

if the data block is not found in the second snapshot:

following a link in the second snapshot to the first snapshot;

searching for the data block in the first snapshot (see Figures 2, 3b, 3c and 4 and corresponding texts).

Subject matter of claims 12 – 14 are rejected in the analysis above in claims 1 – 5 and these claims are rejected on that basis.

(10) Response to Argument

Appellant's arguments regarding the rejection of claims 1 - 14:

Argument No. 1: Appellants have pointed out that the WAFL file system does not disclose that any snapshot descends from another snapshot (Page 5, The Brief).

Argument No. 2: Appellants argue that Figures 2, 3 and 4 do not show any snapshot that descends from another snapshot (Page 5, The Brief).

Argument No. 3: Appellants argue that Hitz does not disclose a snapshot descending from another snapshot (Page 6, The Brief).

Examiner's Response to Arguments:

In response to Argument Nos. 1, 2 and 3:

Appellants' main argument is that Hitz does not disclose a snapshot descending from another snapshot.

Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification. See MPEP 2111 [R-1]

Interpretation of Claims-Broadest Reasonable Interpretation

During patent examination, the pending claims must be 'given the broadest reasonable interpretation consistent with the specification.' Applicant always has the opportunity to amend the claims during prosecussion and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

In response to applicant's main argument that Hitz's does not disclose a snapshot descending from another snapshot, Hitz's teachings of WAFL's system where WAFL's primary distinguishing characteristic is **Snapshots**, **which are read-only copies of the entire file system** (multiple files, e.g., a volume). WAFL creates and deletes Snapshots automatically at prescheduled times, and it keeps up to 20 Snapshots on-line at once (copies of the original files) to provide easy access to old versions of files (see also Figures 2 and 3).

Snapshots use a copy-on-write technique to avoid duplicating disk blocks that **are the same in a Snapshot as in the active file system**. Only when blocks in the active file system are modified or removed do Snapshots containing those blocks begin to consume disk space.

Users can access Snapshots through NFS to recover files (snapshots) that they have accidentally changed or removed, and **system administrators can use Snapshots to create backups (copies of the files, i.e. first and/or second files) safely from a running system** (please see Page 6).

Appellants specification teaches the term "descend" in paragraphs [0007, 0018, 0088 and 0101] where appellants' teaches of using a tree structure having a base volume which is similar to Hitz's root inode.

Hitz discloses that a file system (or a snapshot) can be a descend from another file system (or another snapshot) and Hitz disclose a snapshot tree structure having a first snapshot that descends from a base volume and a second snapshot that descends from the first snapshot. In response to applicant's argument, Hitz's teachings of the WAFL system, where the WAFL file system is a tree of blocks with the root inode similar to Applicant's tree structure, which describes the inode file, at the top, and meta-data files and regular files underneath (see Figures 1 and 2).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Shahid Al Alam/

Primary Examiner, Art Unit 2162

Conferees:

/Mohammad Ali/

SPE, Art Unit 2169

/John Breene/

Supervisory Patent Examiner, Art Unit 2162